

# **FAST HARD DISK PLUGGING AND REJECTING DEVICE**

## **BACKGROUND OF THE INVENTION**

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### **1. Field of the invention**

The present invention relates to a fast hard disk plugging and rejecting device, and more particularly to a fast hard disk plugging and rejecting device outside a computer case.

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### **2. DESCRIPTION OF THE PRIOR ART**

Because the conventional connecting head of the hard disk can not be rapidly plugged or rejected, it has to be performed manually. However, an insufficient or uneven force always causes an insufficient contact so as to disable the hard disk, or an incorrect assembling direction may cause a damage of the probe of the hard disk. Furthermore, generally, it has to employ a bigger force for connecting or separating the hard disk, and this will be an operational difficulty for the user having a smaller hand or a smaller strength. Therefore, an elastic probe can be employed to connect the hard disk for overcoming the conventional operation difficulty so as to ensure that the connection quality will not be influenced by the operator and the connection can be achieved semi-automatically.

25 In addition, in the past, the hard disk is always built-in the

computer or formed as an external box for storage or reading, as shown in Fig. 1. If the user wants to take the hard disk 11 out of the removable hard disk box 1, it has firstly to turn the handle 12 up and pull it out for departing the hard disk from the case, 5 then the user takes off the upper cover 13 from the box 1 and pulls the converter 14 which is connected to the hard disk 11 for completely taking the hard disk out. Furthermore, before performing this operation, it has to turn off the computer first, and it is also impossible to reject or plug the hard disk as the 10 computer is running.

Thus, it can be seen, the prior art described above still has some defects, is not a good design, however, and is urgently to be improved.

Because of the technical defects of described above, the 15 applicant keeps on carving unflaggingly to develop a fast hard disk plugging and rejecting device through wholehearted experience and research.

## SUMMARY OF THE INVENTION

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One objective of the present invention is to provide a good mobility and removability of a fast hard disk plugging and rejecting device through an elastic probe embedded at each contacting hole inside a connector of the device, and therefore, 25 the probe in the connector and a connecting head of the hard

disk are conducted through a pressed contact there between when the hard disk is plugged therein, and the hard disk can be fast exited by utilizing the exiting mechanism.

Another objective of the present invention is to provide a 5 fast hard disk plugging and rejecting device, which can be adapted to different standards of the hard disk in the market.

Another further objective of the present invention is to provide a fast hard disk plugging and rejecting deice through which the user can easily and rapidly reject the hard disk so as 10 to save labor and avoid a damage to the hard disk when the user plugs and rejects the hard disk through the conventional way.

For achieving the purposes described above, the fast hard disk plugging and rejecting device includes: an upper and a bottom covers, a panel, a backside covering plate, a side 15 covering plate, a guiding plate, a partition, an exiting button, an exiting mechanism and a connector, wherein two sides of the bottom cover are respectively connected with a side covering plate, a back side thereof is connected with the backside covering plate, and a front side thereof is connected with the 20 panel, a plugging and rejecting opening is positioned at the central portion of the panel, a rotary lifting dust cover is mounted at the plugging and rejecting opening, the exiting button is set at a proper position on the side of the panel, the guiding plate is mounted behind the panel and has a guiding rail 25 which has a relatively larger upper space and relatively smaller

lower space for different standards of the hard disk, a connector is positioned at a back end of the guiding plate, the partition is further connected to the connector, each contacting hole inside the connector is embedded by an elastic probe, and the exiting 5 mechanism is mounted at one side of the guiding plate which is active when operate the exiting button. After combining with the upper cover, the fast hard disk plugging and rejecting device is achieved.

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#### **BRIEF DESCRIPTION OF THE DRAWINGS**

The drawings disclose an illustrative embodiment of the present invention, which serves to exemplify the various advantages and objects hereof, and are as follows:

15 Fig. 1 is a decomposition drawing of a conventional removable hard disk;

Fig. 2 is a three-dimensional decomposition drawing showing a fast hard disk plugging and rejecting device according to the present invention;

20 Fig. 3 is a partial assembling drawing showing a fast hard disk plugging and rejecting device according to the present invention;

Fig. 4 is a three-dimensional assembling drawing showing a fast hard disk plugging and rejecting device according to the 25 present invention;

Figs. 5A~5B are action schematic views showing a spring and a probe in a connector of a fast hard disk plugging and rejecting device according to the present invention;

Fig. 6 is a perspective drawing showing an exiting 5 mechanism of a fast hard disk plugging and rejecting device according to the present invention;

Figs. 7A~7B are schematic views showing the orientation of a fast hard disk plugging and rejecting device according to the present invention; and

10 Figs. 8A~C are practicing views showing a fast hard disk plugging and rejecting device according to the present invention.

## **DETAILED DESCRIPTION OF THE PREFERRED**

### **15 EMBODIMENT**

Please refer to Figs. 2~6 showing the fast hard disk plugging and rejecting device according to the present invention. The device includes:

20 a bottom cover 2 connected to a side covering plate 3 through two sides thereof and to a backside covering plate 4 through a back end thereof, wherein the backside covering plate 4 includes more than one connector 41 disposed thereon;

25 a panel 5 having a plugging and rejecting opening 51 which has a relatively larger upper space and a relatively smaller

lower space and a rotary lifting dust cover 52 mounted thereon, an opening 53 positioned at a proper position of the panel 5 and having an exiting button 54 mounted thereon, wherein the panel 5 is connected with a front end of the bottom cover 2;

5        a guiding plate 6 positioned at the backside of the panel and comprising guiding rail 61 and 62, which form a relatively larger upper space and a relatively smaller lower space for different standards of hard disks, and a sliding way 63 mounted at a proper position of one side of the guiding plate 6;

10      one or more connector 7 comprising a front and a back probe insulating bases 71 and 72 which are combined together through a partition 73 there between for stably combining thereof, wherein:

15      the front probe insulating base 71 comprises plural contacting holes 711, a circular inverted angle 714 mounted at a front end of the contacting hole 711, a probe 712 mounted in the contacting hole 711, and a spring 713 sleeved on a back end of the probe 712, wherein the front end of the probe 712 is broadened for contacting and the elasticity of the spring 713 is

20      employed for ensuring a good connection between the probe 712 and the connecting head 101 of the hard disk 10 (as shown in Figs. 5A~5B), and the inverted angle 714 at the front end of the contacting hole 711 corrects a connecting way of a connecting head of the hard disk 10 so as to ensure a good connection

25      between the connecting head 101 of the disk 10 and the probe

712; and

the back probe insulating base 72 is combined with the back end of the front probe insulating base 71 and comprises a contacting wire 721 set at a center thereof for contacting with  
5 the spring 713 behind the probe 712;

an exiting mechanism 8 comprising a body 81, a position measuring rod 82, an orientating element 83, a spring 84 and a linking-up bar 85 (as shown In Fig. 6), wherein:

the body 81 comprises a first sliding trough 811 mounted at  
10 one side of a front end thereof, wherein a guiding trough 812 is mounted in the first sliding trough 811, an opening 813 passed through a central portion thereof, and a second sliding trough 814 mounted at one side of a back end thereof, wherein a blocking portion 815 is set in the second sliding trough 814 at a  
15 proper position;

the position measuring rod 82 is a L-shaped rod, comprises a guiding pillar 821 extending from a side thereof, and is arranged in the first sliding trough 811 of the front end of the body 81, wherein the guiding pillar 821 of the position  
20 measuring rod 82 is arranged in the guiding trough 812 of the first sliding trough 811;

the orientating element 83 comprises an inclined plane 831 respectively on an upper and a bottom portions of one side thereof, an orientating bolt 832 extending from a central  
25 portion of the side thereof, a circular hole 833 mounted at the

other side thereof, and a spring 84 inside the circular hole 833, wherein the orienting element 83 is arranged in the opening 813 of the body 81 and one end of the spring 84 is rejected in the circular hole 833 and the other end of the spring 84 is rejected 5 against the side covering plate 3; and

the linking-up bar 85 comprises two pushing bars 851 respectively having an inclined plane 852 at a front end thereof, and a rejecting portion 853 positioned between the two pushing bars 851, wherein the pushing bars 851 are arranged in the 10 second sliding trough 814 of the body 81 so as to protrude a back end of the linking-up bar 85 out of the body 81 and a facet of the back end of the linking-up bar 85 will be contacted with the exiting button 54 on the panel 5; and

a upper cover 9, wherein the bottom cover 2 is assembled 15 thereon so as to form a space there between for positioning each component.

Through the probe and the spring embedded in the contacting hole inside the connector, the probe in the connector 7 and a connecting head 101 of the hard disk 10 will be 20 conducted through a pressed contact there between when the hard disk 10 is plugged therein, and the hard disk can be rejected by utilizing the exiting mechanism 8 for effectively and conveniently plugging and rejecting. The connector 7 of the guiding plate 6 is conducted with the connector 41 of the 25 backside covering plate 4 for receiving a reading by the hard

disk of the computer and a power input.

Please refer to Figs. 7A~B which are schematic views showing the orientation of a fast hard disk plugging and rejecting device according to the present invention. When the 5 position measuring rod 82 intend to detect the position of the hard disk 10, the position measuring rod 82 will induce the orientating bolt 832 to plug into a screwing hole 102 at one side of the hard disk 10 as the hard disk 10 arrives a predetermined position, and at this time, all the lines are conducted and part of 10 the hard disk 10 will be exposed to the exterior of rejecting opening 5. When it wants to reject the fixed hard disk 10, the user only needs to press the exiting button 54, and then the exiting button 54 will push the linking-up bar 85, the inclined plane 853 of the linking-up bar 85 will push the inclined plane 15 831 of the orientating element 83 so as to move the orienting element outwardly, and the orientating bolt 832 of the orienting element 83 will therefore depart from the screwing hole 102 at the side of the hard disk 10. If the user stops to press the exiting button 54, the position measuring rod 82 will be homed 20 so as the linking-up bar 85, and the orientating element will also be homed due to the elasticity of the spring 84. At this time, all the lines are come off, and the hard disk can be taken out.

Please refer to Figs. 8A~8C which practicing views 25 showing a fast hard disk plugging and rejecting device

according to the present invention. Fig. 8 shows a condition as the hard disk 10 is unplugged, wherein the connector 7 is set at the upper and lower portions, Fig. 8B shows a condition as a larger standards hard disk 10 is plugged in the connector 7 at 5 the upper portion, wherein the hard disk 10 can be rejected through the exiting mechanism 8, and Fig. 8C shows a condition as a small standards hard disk 10 is plugged in the lower connector 7, wherein the hard disk 10 can be rejected just by hand.

10 The fast hard disk plugging and rejecting device according to the present invention, when being compared with the other prior arts, further includes the advantages as follows:

1. The present invention provides a fast hard disk plugging and rejecting device outside the case so as to own a good 15 mobility and removability.

2. The present invention provides a fast hard disk plugging and rejecting device employing a guiding rail having a relatively larger upper space and a relatively smaller lower space for adapting different standards of different hard disks in 20 market so as to facilitate the popularization of the present invention.

3. The present invention provides a fast hard disk plugging and rejecting device, through which the user can easily and effectively reject the hard disk so as to save labor and avoid a 25 damage to the hard disk when the user plugs and rejects the

hard disk through the conventional way.

4. The present invention provides a fast hard disk plugging and rejecting device which employs the elastic probe with the spring made of conductive material for conduction, and the 5 front end of each probe is broadened and the elasticity of the spring ensures a good conduction.

5. Utilizing the connector structure and the orientating method according to the present invention, it can semi-automatically or automatically connect the hard disk for 10 saving the connection time and achieving the purposes of automatic connection, separation and exchange.

Many changes and modifications in the above described embodiment of the invention can, of course, be carried out without departing from the scope thereof. Accordingly, to 15 promote the progress in science and the useful arts, the invention is disclosed and is intended to be limited only by the scope of the appended claims.